WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a substrate having an insulator layer thereon;

a semiconductor layer of a first conductivity type formed on the insulator layer, part of the semiconductor layer functioning as a channel region;

a gate insulator film formed on the channel region of the semiconductor layer;

a gate electrode formed on the gate insulator film;

source/drain regions of a second conductivity type formed in the semiconductor layer so as to sandwich the channel region therebetween; and

a hole-eliminating region having a function of preventing the accumulation of holes of hole-electron pairs generated in the channel region, the hole-eliminating region being formed in a region of the semiconductor layer and adjacent to one of the source/drain regions and to the channel region.

2. The semiconductor device of Claim 1, wherein the hole-eliminating region includes two separate regions in the semiconductor layer, one of the two regions being adjacent to the source and channel regions, while the other region of the two being adjacent to the drain and channel regions.

3. The semiconductor device of Claim 2, further comprising: an on-gate silicide film formed on the gate electrode; and on-substrate silicide films formed on the source/drain

regions, respectively, each of the on-substrate silicide films being spaced from the gate electrode via a gap,

the hole-eliminating regions being located below the respective gaps between the on-substrate silicide films and the gate electrode.

4. The semiconductor device of Claim 1, wherein the hole-eliminating region is a lattice defect region formed by introducing a lattice defect to be a center of recombination.

5. The semiconductor device of Claim 4, wherein a lower part of the channel region is a high-concentration channel region containing an impurity of the second conductivity type having a concentration higher than a concentration in the channel region.

6. The semiconductor device of Claim 4, wherein the lattice defect region is formed to entirely cover lower parts of the source, drain and channel regions in the semiconductor layer.

7. The semiconductor device of Claim 5, wherein the same impurity is introduced into the lattice defect region and the high-concentration channel region.

8. The semiconductor device of Claim 4, wherein the semiconductor device is an n-channel type transistor, and

atoms of a Group 3b element having a larger atomic radius than an atomic radius of an element composing the semiconductor layer are introduced into the lattice defect region.

9. The semiconductor device of Claim 8, wherein the semiconductor layer is composed of silicon single crystals, and

the Group 3b element is at least one of gallium, indium and thallium.

10. The semiconductor device of Claim 4, wherein atoms of a Group 4b element are introduced into the lattice defect region.

11. The semiconductor device of Claim 10, wherein the Group 4b element is at least one of carbon, silicon, and germanium.

12. The semiconductor device of Claim 4, wherein atoms of a Group 0 element (inert gas) are introduced into the lattice defect region.

13. The semiconductor device of Claim 12, wherein the Group 0 element is at least one of argon, krypton, and xenon.

14. The semiconductor device of Claim 1, wherein the hole-eliminating region is a high-concentration diffusion layer containing an impurity of the second conductivity type having a concentration higher than a concentration in the channel region.

15. The semiconductor device of Claim 14, wherein 10^{19} to 10^{21} impurity atoms/cm^3 of the second conductivity type are introduced into the high-concentration diffusion region.

16. A method for fabricating a semiconductor device,

comprising the steps of:

(a) forming an element isolation film on an SOI substrate including at least an insulator layer and a semiconductor layer formed on the insulator layer, the element isolation film surrounding the semiconductor layer;

(b) forming a lattice defect region, a high-concentration channel region and a channel region in the semiconductor layer by implanting, into the semiconductor layer, impurity ions of a first conductivity type, having an atomic radius larger than an atomic radius of an element composing the semiconductor layer, such that a concentration of the semiconductor layer reaches a maximum in a region in the vicinity of an interface between the semiconductor layer and the insulator layer;

(c) forming a gate insulator film on the semiconductor layer;

(d) forming a gate electrode on the gate insulator film;

(e) forming source/region regions in respective regions of the semiconductor layer by introducing an impurity of a second conductivity type into the semiconductor layer by using the gate electrode as a mask, the source/drain regions being located on right and left sides of the gate electrode; and

(f) diffusing and activating the impurity of the first conductivity type and the impurity of the second conductivity

type by heat treatment.

17. The method for fabricating a semiconductor device of Claim 16, wherein the semiconductor device is an n-channel type transistor, and

in the step (b), ions of a Group 3b element are used as the impurity ions of the first conductivity type.

18. The method for fabricating a semiconductor device of Claim 17, wherein the semiconductor layer is composed of silicon single crystals, and

in the step (b), ions of at least one of gallium, indium and thallium are used as the ions of the Group 3b element.

19. A method for fabricating a semiconductor device, comprising the steps of:

(a) forming an element isolation film on an SOI substrate including at least an insulator layer and a semiconductor layer formed on the insulator layer, the element isolation film surrounding the semiconductor layer;

(b) implanting, into the semiconductor layer, ions of an element having such properties as causing lattice defects in the semiconductor layer, such that a concentration of the semiconductor layer reaches a maximum in a region in the vicinity of an interface between the semiconductor layer and the insulator layer;

(c) forming a high-concentration channel region and a channel region by implanting impurity ions of a first conduc-

tivity type into the semiconductor layer such that the concentration of the semiconductor layer reaches a maximum in a bottom region of the semiconductor layer;

(d) forming a gate insulator film on the semiconductor layer;

(e) forming a gate electrode on the gate insulator film;

(f) forming source/region regions in respective regions of the semiconductor layer by introducing an impurity of a second conductivity type into the semiconductor layer by using the gate electrode as a mask, the source/drain regions being located on right and left sides of the gate electrode; and

(g) diffusing and activating the impurity of the first conductivity type and the impurity of the second conductivity type by heat treatment.

20. The method for fabricating a semiconductor device of Claim 19, wherein in the step (b), ions of a Group 4b element are used as the ions of the element having such properties as causing the lattice defects.

21. The method for fabricating a semiconductor device of Claim 20, wherein in the step (b), ions of at least one of carbon, silicon and germanium are used as the ions of the Group 4b element.

22. The method for fabricating a semiconductor device of Claim 19, wherein in the step (b), ions of a Group 0 element

are used as the ions of the element having such properties as causing the lattice defects.

23. The method for fabricating a semiconductor device of Claim 22, wherein in the step (b), ions of at least one of argon, krypton and xenon are used as the ions of the Group 0 element.

24. A method for fabricating a semiconductor device, comprising the steps of:

(a) forming an element isolation film on an SOI substrate including at least an insulator layer and a semiconductor layer formed on the insulator layer, the element isolation film surrounding the semiconductor layer;

(b) forming a semiconductor layer of a first conductivity type including at least a channel region in the semiconductor layer by introducing an impurity of the first conductivity type into the semiconductor layer;

(c) forming a gate insulator film on the semiconductor layer;

(d) forming a gate electrode on the gate insulator film;

(e) forming insulator sidewalls on both side faces of the gate electrode;

(f) forming source/drain regions in respective regions of the semiconductor layer by introducing an impurity of a second conductivity type into the semiconductor layer by using the gate electrode and the insulator sidewalls as a mask,

the source/drain regions being located on right and left sides of the gate electrode;

(g) forming silicide films on the gate electrode and the source/drain regions, respectively;

(h) selectively removing the insulator sidewalls;

(i) implanting ions of a hole-eliminating element into the semiconductor layer by using the silicide films as a mask such that a concentration of the semiconductor layer reaches a maximum in a region in the vicinity of an interface between the insulator layer and the semiconductor layer; and

(j) diffusing and activating the impurity of the first conductivity type and the impurity of the second conductivity type by heat treatment.

25. The method for fabricating a semiconductor device of Claim 24, wherein in the step (i), ions of an element having such properties as causing lattice defects are used as the ions of the hole-eliminating element.

26. The method for fabricating a semiconductor device of Claim 25, wherein in the step (i), ions of a Group 4b element are used as the ions of the element having such properties as causing the lattice defects.

27. The method for fabricating a semiconductor device of Claim 26, wherein in the step (i), ions of at least one of carbon, silicon and germanium are used as the ions of the Group 4b element.

28. The method for fabricating a semiconductor device of Claim 25, wherein in the step (i), ions of a Group 0 element are used as the ions of the element having such properties as causing the lattice defects.

29. The method for fabricating a semiconductor device of Claim 28, wherein in the step (i), ions of at least one of argon, krypton and xenon are used as the ions of the Group 0 element.

30. The method for fabricating a semiconductor device of Claim 25, wherein in the step (b), the impurity ions of the first conductivity type are implanted into the semiconductor layer such that a concentration of the semiconductor layer reaches a maximum in a bottom region of the semiconductor layer, thereby forming a high-concentration channel region and the channel region in the semiconductor layer.

31. The method for fabricating a semiconductor device of Claim 24, wherein in the step (i), impurity ions of the first conductivity type having a concentration higher than a concentration in the channel region are used as the ions of the hole-eliminating element.

32. The method for fabricating a semiconductor device of Claim 31, wherein in the step (i), a dose of the impurity ions of the first conductivity type is set at $5 \times 10^{13}/cm^3$ or larger.